Frontier Hard Chrome
ISRM Treatment Wall Design
Work Assignment Number: 134-RDRD-1027

EPA Region V

RAC

Response Action Contract

EPA Contract: 68-W7-0026

December 2002

Weston Solutions, Inc. · 190 Queen Anne Avenue North · Seattle, WA 98109-4926

INSITU REDOX MANIPULATION TREATMENT WALL DESIGN
FRONTIER HARD CHROME
VANCOUVER, WASHINGTON

Prepared for

U.S. EPA Contract No. 68-W7-0026
U.S. Environmental Protection Agency
Region X
1200 Sixth Avenue
Seattle, WA 98101

Contract No. 68-W7-0026
Work Assignment No. 134-RDRD-1027
Work Order No. 20064-134-100-1110
Document Control No. RFW134-2F-AMGK

December 11, 2002

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EXHIBIT B

SCOPE OF WORK

ISRM Wall Design – Frontier Hardchrome

FRONTIER HARDCHROME
VANCOUVER, WASHINGTON

INSITU REDOX MANIPULATION (ISRM) WALL DESIGN
SCOPE OF WORK

1.0 GENERAL

The Frontier Hardchrome (FHC) Site is located in the southwestern part of Washington State. The site is approximately one-half mile north of the Columbia River and covers about one-half acre. Frontier Hardchrome is located at 113 East Y Street, Vancouver, Washington.

In approximately 1955, the site was filled with hydraulic dredge material and construction rubble. Since then the site has been primarily occupied by two businesses, both engaged in the chrome plating business. Pioneer Plating operated at the site from 1958 to 1970. The site was then occupied by FHC until 1983. The property has been leased to various other businesses since 1983. Presently, the FHC facility is being used as a truck driving school. Soil and groundwater at FHC are contaminated with hexavalent chromium.

The work covered under this document includes installation of an in-situ treatment wall constructed through a series of reagent injections into the subsurface soil. The work consists of installation of several treatment wells, procurement and delivery of the diothionite reagent, mixing the reagent with water and injection into the treatment well, installation of performance monitoring wells to monitor the wall performance, diothionite extraction, and disposal.

The FHC site is a Superfund Site and work must be done in an environmentally safe manner. Hazardous materials (primarily soil) are present on the site. The Consultant shall be cognizant of potential local business and community impacts (such as noise, dust, access blockages, odors, etc.) and perform the work with due consideration of these concerns.

1.1 DEFINITIONS

The following definitions apply to this scope of work:

Project Manager−The individual responsible for overall management, schedule and cost control of the project. The Project Manager will be an employee of Weston Solutions, Inc. (WESTON) and will reside in WESTON's home office in Seattle.

Construction Manager−The U.S. EPA on-site, full time designee responsible for managing and overseeing performance of the construction work. The Construction Manager will be an employee of WESTON. The Construction Manager has complete authority over the scope of work. The Construction Manager may designate a resident engineer to assume on-site responsibilities in his absence.

Consultant−The firm contracted by WESTON to provide technical assistance, equipment and installation sampling during wall installation. The Consultant reports to the Construction Manager.

Subcontractor−Firms contracted by the Construction Manager to perform certain portions of the work. Subcontractors report to the Construction Manager.

Site Health and Safety Coordinator (SHSC)−The individual responsible for implementing the WESTON site-specific health and safety plan (HASP) and general oversight of the Consultants health and safety program. The SHSC, may by periodic observation of site activities, confirm that the provisions of the WESTON HASP and the Consultants health and safety program are being followed. Such observations should not be construed as detailed inspections and will not relieve the Consultant of direct responsibility for the health and safety of its employees. The SHSC will have the authority to require the Consultant to address deficiencies observed. The SHSC will be a WESTON employee.

Site Safety Officer (SSO)−The individual responsible for implementing the Consultants Health and Safety Plan (HSP) ensuring day-to-day activities are being performed safely. The SSO is responsible for enforcing PPE requirements, contaminant monitoring (as required), medical record and training record maintenance, safe housekeeping and other safety related functions. The SSO is a Consultant employee and reports indirectly to the SHSC.

2.0 WORK ACTIVITIES

The following is a list of activities WESTON will be responsible for completing:

- Comply with substantative requirements of City permits and coordinate work with appropriate City personnel.

- Provide project oversight.
- Ensure no unsafe conditions to the community occur as a result of performance of the work
- Designate exclusion zones (signs, barriers, etc.).
- Provision of run-off controls (silt fence).
- Physical site security (site fencing).
- Field verify and mark the location of all utilities.
- Maintain on-site equipment decontamination area.
- Installation of treatment, operational, and groundwater monitoring wells.
- Provision of electrical, water and sanitation facilities.
- Provision of road crossings, water hose and discharge hose.
- Provision of diothionite reagent.
- Manage soil and water generated from well installation.
- Dispose of all PPE.

The following is a list of activities the Consultant will be responsible for completing:

- Mobilize all injection/extraction/laboratory equipment to the site.
- Provide diothionite reagent mixing equipment, process control equipment and instrumentation.
- Provide appropriate labor and technical expertise during reagent injection and withdrawal.
- Provide equipment to extract the reagent.
- Completion of an ISRM wall installation report.

3.0 SUBMITTALS

Provide submittals in accordance with specification Section 01300.

4.0 HEALTH AND SAFETY

While on-site, the Consultant shall adhere to all health and safety requirements as set forth in the HASP prepared by WESTON. The Consultant shall also adhere to the requirements set forth in their own HSP. The Consultant shall designate a safety officer that shall be responsible for assuring the Consultant's employees adhere to all safety requirements.

5.0 INTERFACE WITH OTHER CONTRACTORS/COMPANIES

The Consultant will be required to interface with other contractors and entities at the site to minimize conflicts and facilitate wall installation activities. These contractors/entities are:

5.1 WESTON SOLUTIONS, INC.

WESTON will provide overall project management and supervision of the Consultant. The WESTON SHSC will periodically observe the Consultants work to confirm that the provisions of the WESTON HASP and the Consultants HSP are being followed. The Consultant will be required to interface with WESTON's SHSC and Construction Manager.

5.2 CASSIDY MANUFACTURING

Cassidy Manufacturing is located adjacent to the Richardson Metals Works Building (which is to be demolished). WESTON/Consultant shall install the ISRM Wall in a manner that does not interrupt activities at Cassidy; does not block the flow of traffic into and out of Cassidy's facility; and does not damage the Cassidy facility or their utilities.

6.0 SUPPORT FACILITIES

WESTON will provide portable toilets for site use. WESTON will provide a site office trailer including an office for the Consultant. WESTON will provide limited on-site equipment storage facilities.

7.0 DRAWINGS, SPECIFICATIONS AND PLANS

This design package contains the following Drawings, Specifications and Plans to be used for ISRM Wall installation:

Drawings

Drawing Number	Revision Number	Title
100	0	ISRM Wall Installation Plan

7.1 Specifications

DIVISION 1 – GENERAL		
01027	12-10-02	Application for Payments
01100	12-10-02	Environmental Protection
01101	12-10-02	Materials Handling
01200	12-10-02	Project Meetings
01300	12-10-02	Submittals
01310	12-10-02	Construction Scheduling
01390	12-10-02	Health and Safety
01500	12-10-02	Construction Facilities and Temporary Controls
01505	12-10-02	Mobilization
01700	12-10-02	Contract Closeout
01720	12-10-02	Project Record Documents
01850	12-10-02	Security
DIVISION 2 – SITE WORK		
02050	12-10-02	ISRM Wall Installation

7.2 Plans

- Site Health and Safety Plan
- Site Management Plan

8.0 SCHEDULE

Schedule

Mobilization Complete: xxxxx

Wall Installation Complete xxxxx

Number of days on-site, including mobilization and demobilization: Days*

Consultant will normally work:
Hours/Day (Consultant to Complete)
Days/Week (Consultant to Complete)

* Time in calendar days from receipt of award.

CONTENTS

PART 1–GENERAL

1.01 REQUIREMENTS

A. Submit Applications for Payment to Project Manager in accordance with the schedule established by Conditions of the Contract and Agreement between Project Manager and Consultant.

1.02 FORMAT AND DATA REQUIRED

A. Submit monthly report and payment applications to the Project Manager on the forms provided in Attachment 01027.

B. Provide itemized data on continuation sheet.

1.03 PREPARATION OF APPLICATION FOR EACH PROGRESS PAYMENT

A. Application Form:

1. Fill in required information prior to date of submittal of application.

2. Provide all backup and supporting information for all pay items. This documentation includes employee names and hours worked, material receipts, per diem backup, rental equipment receipts and any other documentation needed to support the claimed costs.

3. Execute certification with signature of a responsible officer of Consultant.

1.04 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

A. When the Project Manager requires substantiating data; submit suitable information with a cover letter identifying:

1. Project.
2. Application number and date.
3. Detailed list of enclosures.

B. For stored products:

1. Item number and identification as shown on application.
2. Description of specific material.

1.05 PREPARATION OF APPLICATION FOR FINAL PAYMENT

A. Fill in Application form (Final Payment) provided in Attachment 01027 as specified for progress payments.

B. Use continuation sheet for presenting the final statement of accounting as specified in Section 01700-Contract Closeout.

1.06 SUBMITTAL PROCEDURE

A. Submit Application for Payment to Project Manager at the times stipulated in the Agreement.

B. Number: Three copies of each Application.

C. When Project Manager finds Application for payment properly completed and correct, he will transmit application for payment and the approved invoice to WESTON accounts payable to initiate payment to Consultant.

PART 2−PRODUCTS

NOT USED

PART 3–EXECUTION

NOT USED

END OF SECTION

ATTACHMENT 01027

PAYMENT APPLICATION AND CERTIFICATE FORM

PAYMENT APPLICATION AND CERTIFICATE SIGNATURE PAGE (FINAL PAYMENT)

PAYMENT APPLICATION AND CERTIFICATE

PROJECT: _____ WORK ORDER NO.: _____

PAYMENT ESTIMATE: _____ DATE: _____

PERIOD FROM _____ TO _____ SHEET _____ OF

CONTRACTOR: _____

1.	Total Payments to Date (previous certificates for payment)	$_____
2.	Labor (this period)	$_____
3.	Materials (this period)	$_____
4.	Other (this period)	$_____
5.	Current Payment Due (2+3+4)	$_____
6.	Total Value of Work to Date (1+5)	$_____

The undersigned Contractor certifies that the Work covered by this application for Payment has been completed in accordance with the Contract Documents, that all amounts due to date have been paid by him for Work for which previous Certificates for Payment were issued and payments received from the Construction Manager, and that the current payment shown herein is now due.

_____ _____ _____

Contractor By Date

I hereby acknowledge that the material and labor involved on the above estimate are correct and payment on same is due contractor.

_____ _____

Weston Solutions, Inc. Date

PAYMENT APPLICATION AND
CERTIFICATE SIGNATURE PAGE
(FINAL PAYMENT)

PROJECT: _____ WORK ORDER NO. _____

APPLICATION NO.: _____ DATE: _____

PERIOD FROM _____ TO _____ 19____ SHEET ___ OF

CONTRACTOR: _____

I Hereby Acknowledge that this contract has been completed in substantial compliance with the items of the agreement, Specifications and Plans. I, therefore, recommend acceptance of the work and processing of this final estimate as showing the total amount of money due to Contractor in compliance with the terms of the Contract.

_____ _____

CONSTRUCTION MANAGER DATE
Weston Solutions, Inc.

CONTRACTOR: _____

ADDRESS: _____

_____

CITY STATE ZIP CODE

With the acceptance of this final payment, we, the Contractor, release the Construction Manager and Agents from all claims and all liability to us, the Contractor, for all things done or furnished in connection with the Work, and every act of the Construction Manager and all others relating to, or arising, out of the Work.

_____ _____

SIGNATURE DATE

_____

TITLE

PART 1–GENERAL

1.01 SUMMARY

A. This section outlines the minimum measures to be employed for the protection of the environment to the greatest extent possible during site operations. Environmental protection requires considerations of noise level and protection of air, water and land resources. It involves solid waste management and activities aimed at abatement of pollution in general.

B. Comply with the measures outlined in this section, the Site Management Plan, and all applicable local, state, and federal regulations. The Construction Manager has the authority to stop all work if conditions of noncompliance exist.

1.02 REFERENCE STANDARDS

A. Code of Federal Regulations (CFR):

1. 29 CFR 1910 Occupational Health and Environmental Control

2. 40 CFR 261 Regulations Identifying Hazardous Waste

3. 40 CFR 262 Regulations for Hazardous Waste Generators

4. 40 CFR 263 Regulations for Hazardous Waste Transporters

5. 40 CFR 264 Regulations for Construction Managers and Operators of Permitted Hazardous Waste Facilities

6. 40 CFR 300 Procedures for Planning and Implementing Off-Site Response Actions

7. 49 CFR 178 Regulations for Shipping Container Specifications

B. Washington Administrative Codes (WACs)

1. WAC 173-60 Noise Control Act

2. WAC 173-303 State Regulations for Dangerous Waste

3. WAC 173-303-170 Regulations for Dangerous Waste Generators

4. WAC 296-24, 27, 44, 62, and 155 Washington State Department of Labor and Industries Safety and Health Regulations

5. WAC 173-160 Minimum Standards for Construction and Maintenance of Wells

6. WAC 173-218 Underground Injection Control Program

C. Southwest Clean Air Agency

1. Visible Dust Rule

D. City of Vancouver Ordinances and Building Codes

1. Building Codes
2. Grading and Drainage Requirements
3. Fire Codes
4. Utility Modifications
5. Traffic Ordinances

1.03 COMPLIANCE WITH LAWS

A. Comply with all applicable federal, state, county and municipal laws concerning unwanted environmental impacts of air, soil, stormwater drainage, and groundwater.

PART 2−PRODUCTS

NOT USED

PART 3−EXECUTION

3.01 NOISE LEVELS

A. Noise level requirements are discussed in the Site Management Plan. Noise shall be limited to 70 dBA at the facility boundary.

3.02 CONTROL AND DISPOSAL OF PRODUCTS

A. Hazardous Type Waste: Remove, handle, and dispose of all hazardous waste in accordance with applicable federal and state regulations and codes. Store hazardous substances in approved containers (49 CFR 178) properly labeled to identify the type of substances and date the container was filled. Remove the containers from the Site, store and dispose of hazardous substances in accordance with 40 CFR 263 and 264.

3.03 WATER RESOURCES PROTECTION

A. Water Pollution: Do not pollute or allow the pollution of drainages with diothionite reagents, trash or other harmful materials and substances.

B. WESTON will maintain the site silt fence to control sediment runoff.

3.04 AIR RESOURCES PROTECTION

A. Dust Control: WESTON will be responsible for applying water to the site as necessary to control dust.

3.05 DISPOSAL OF DEBRIS, RUBBISH, AND SOLID WASTE

A. Debris and Rubbish: Consultant shall minimize the generation of solid waste to the extent possible. WESTON will provide waste disposal containers for incidental solid waste (e.g. PPE, papers, small waste debris).

B. Solid Waste: Place solid wastes in containers. Do not prepare, cook, or dispose of food on-site. Prevent contamination of the site and other areas when handling and disposing wastes.

END OF SECTION

PART 1−GENERAL

1.01 SUMMARY

A. Handle bulk reagents in a manner that avoids leaks and spills.

B. Ensure proper material designation and compliance with regulatory requirements for transporting, handling, storage, and disposal.

C. Properly handle and store well installation soil cuttings.

1.02 REFERENCE STANDARDS

A. Code of Federal Regulations

1. 40 CFR 268-Hazardous Waste Disposal
2. 40 CFR 112 - Spill Prevention Control and Countermeasure Plans
3. 49 CFR 171 - 179 - Packaging, marking labeling, and shipping of Hazardous Materials.

B. Washington State Regulations

1. WAC 173-303. Washington Dangerous Waste Regulations

PART 2−PRODUCTS

NOT USED

PART 3−EXECUTION

3.01 BULK MATERIALS HANDLING

A. Reagents: Handle bulk reagents such that leaks and spills are prevented. Leaking hoses and or connections shall be re-fitted or repaired to stop leaks. Tanker trucks or storage tanks used for storing reagents shall be properly marked and shall not be located in the public right of way or in high traffic areas. Only properly trained personnel shall be allowed to make connections and operate bulk material transfer equipment. Ensure reagents and all other chemical containers are appropriately marked.

B. Decontamination Wastes: Personnel decontamination facilities (provided by WESTON) consist of a temporary decontamination area and decontamination liquid storage tank/drum. WESTON will transfer personnel decontamination solutions to a storage tank/drum.

Decontamination of Consultants equipment will be the responsibility of the Consultant. Equipment that comes into contact with soil inside the exclusion area (shown on the drawings) shall be decontaminated before leaving the site. Decontamination will be performed by manually removing bulk soil from the equipment in an area of known pre-existing soil contamination adjacent to the northeast corner of the former Frontier Hardchrome Building as shown on the drawings. After bulk decontamination has been performed, equipment shall undergo a final decontamination using a low flow portable spray washer (such as weed sprayer). Use of water for decontamination shall be kept to a minimum. After decontamination, equipment shall be moved immediately into the adjacent clean zone to avoid re-contamination.

Decontamination of WESTON rented equipment and reagent delivery trucks will be performed by WESTON. Every effort will be made to keep reagent delivery trucks in an uncontaminated area.

C. Well Installation Soil Cuttings: Soil cuttings from well installation will be drummed with lids. Drums shall be stored in the area east of the former Frontier Hardchrome Building as shown on the drawings. Properly mark all drums.

3.02 ON-SITE MATERIAL STORAGE

A. Consultant shall keep storage of bulk materials onsite to a minimum. WESTON/Consultant shall perform periodic inspections of their storage tanks, trucks and drums to check for leaks. No more than two truckloads of reagent shall be located

on the site at any one time. WESTON will coordinate shipments of reagents to limit the quantity stored onsite.

B. Non-Contaminated Material: WESTON will provide a CONEX box for temporary storage of equipment and parts.

END OF SECTION

PART 1−GENERAL

1.01 REQUIREMENTS INCLUDED

A. Construction Manager will schedule and administer the pre-construction meeting, weekly progress meetings, and specially called meetings throughout progress of the work as needed. Construction Manager will:

1. Prepare agenda for meetings.
2. Distribute written notice of each meeting two days in advance of meeting date.
3. Make physical arrangements for meetings.
4. Preside at meetings.
5. Record the minutes; include significant proceedings and decisions.
6. Reproduce and distribute copies of minutes after each meeting to:
   a. Participants in the meeting.
   b. Parties affected by decisions made at the meeting.

1.02 PRE-CONSTRUCTION MEETING

A. Schedule prior to commencement of wall installation.

B. Time and Location: a central site, convenient for all parties, mutually agreed upon.

C. Attendance:

1. Project Manager.
2. Construction Manager.
3. EPA Representative.
4. Consultant's Project Manager.
5. Governmental representatives as appropriate.
6. Others as appropriate.

D. Agenda will include:

1. Distribution and discussion of:

a. List of major Contractors and suppliers.
b. Projected Construction Schedules.

2. Construction Schedule and critical work sequencing.
3. Major equipment deliveries.
4. Designation of responsible personnel.
5. Procedures and processing of:
   a. Applications for Payment.
6. Procedures for maintaining Record Documents.
7. Use of premises:
   a. Office, work and storage areas.
   b. Other
8. Construction facilities, controls and construction aids.
9. Temporary utilities.
10. Safety and first-aid procedures.
11. Security procedures.
12. Housekeeping procedures.
13. Provisions for spill prevention control and counter measures and emergency contingency plan.
14. City, community and local business issues.

1.03 PROGRESS MEETINGS

A. Construction Manager may schedule weekly meetings as needed.

B. Location of the meetings: Meetings will be held at project site unless otherwise directed by Construction Manager.

C. Attendance:

1. Construction Manager
2. Consultant
3. Others, as appropriate

D. Purpose of Meeting:

1. Review of work progress since previous meeting.
2. Field observations, problems, and conflicts.
3. Problems that impede Construction Schedule.
4. Corrective measures and procedures to regain projected schedule.
5. Revisions to Wall Installation Schedule.
6. Progress, schedule during succeeding work period.

7. Review proposed changes for:
   a. Effect on Construction Schedule and on completion date.
   b. Effect on cost
8. City, community and local business issues.
9. Other business.

1.04 TECHNICAL MEETINGS

A. Project Manager will schedule technical meetings as appropriate.

B. Location of the meetings: Meetings will be held at a location determined by the Project Manager.

C. Attendance:

1. Project Manager
2. EPA Representative
3. Consultant
4. Others, as appropriate

D. Purpose of meetings: Technical meetings may be called by the Project Manager before, during and after installation of the ISRM wall. The meetings may be called to:

- Review the technical aspects of the project prior to mobilizing to the site
- Resolve implementability issues that arise during the work
- Review wall installation design changes
- Establish post-wall installation operation and maintenance
- Evaluate the walls performance and success of installation
- Discuss any other technical issues that arise

PART 2−PRODUCTS

NOT USED

PART 3−EXECUTION

NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Assume responsibility for developing, reviewing, editing and preparing submittals to satisfy the requirements of each specific section of the contract documents.

1.02 FORMAT

A. The transmittal sheet provided in Attachment 01300 shall accompany each submittal with the following information furnished:

1. Project Name
2. Submittal Title
3. Submittal Number
4. Reference Section
5. Date
6. Name of contractor, subcontractor, supplier and manufacturer.
7. Changes from Contract Document.
8. Identification of revisions on submittals.
9. Consultant's stamp, initialed or signed, certifying review of submittal.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 SUBMITTAL REQUIREMENTS

A. A list of submittals, including the specification section reference and time due, is summarized in Table 01300. This list may not include all submittals required by this contract and is intended only to aid the Consultant in his timely and complete

submittal of all items required without delay to the project. All submittals shall be provided to the Project Manager.

Table 01300-1 Consultant Submittals

Item	Reference Section	Review Period (Calendar Days)	Submittal Due
Monthly Invoice	01027	7	5 working days after months end
Payment Application and Certificate	01027	7	Monthly Invoice
Payment Application and Certificate Signature Page (Final Payment)	01027	7	Final Invoice
Monthly Reports	01310	7	With Invoice
Consultants Health and Safety Plan	01390	14	7 days after Notice to Proceed
Employees Safety Training Documentation	01390	14	With Consultants HSP
Affidavit of Payment of Debts and Claims	01700	14	Final Payment
Affidavit of Release of Liens	01700	14	Final Payment
Final Adjustment of Accounts	01700	14	Final Payment
Final Application for Payment	01700	7	At Project Completion
Record Documents	01720	14	At Project Completion
ISRM Wall Installation Report	01720	30	45 Days After Work Completion

B. Schedule submittals timely to allow specified review time and need for approval to not delay the work.

C Number of submittals required: Three copies.

D. Consultant may submit electronic submittals. Electronic submittals shall contain all pertinent information, completed forms, and signatures.

3.02 Project Manager's Duties

A. The Project Manager's duties relative to the submittals are as follows:

1. Review for general conformance with Contract Documents.

2. Prepare and submit comments on the deliverables to the Consultant.

3.03 RESUBMITTAL REQUIREMENTS

A. Make corrections or changes in the submittals required and resubmit until approved.

1. Revise initial submittals and resubmit as specified for the initial submittal. Indicate changes, which have been made.

B. Accompany resubmittals with a transmittal sheet.

3.04 REVISIONS TO OTHER DOCUMENTS

A. Approved Consultant submittals may differ from WESTON prepared documents, such as the Site Management Plan. In such cases, WESTON will document the approach proposed in WESTON approved Consultant submittals for the project record.

END OF SECTION

ATTACHMENT 01300

TRANSMITTAL OF CONSULTANT'S SUBMITTAL

TRANSMITTAL OF CONTRACTOR'S SUBMITTAL

(ATTACH TO EACH SUBMITTAL) DATE

TO _____
WESTON SOLUTIONS, INC.
_____
_____
_____

SUBMITTAL NO _____

~ NEW SUBMITTAL ~ RESUBMITTAL
PREVIOUS SUBMITTAL NO _____

FROM _____
CONTRACTOR
_____
_____
_____

PROJECT _____

WORK ORDER _____
SPECIFICATION SECTION NO _____
(COVER ONLY ON SECTION WITH EACH TRANSMITTAL)

SUBMITTAL FOR: ~ SHOP DRAWINGS ~ MATERIAL DATA ~ SAMPLES ~ O & M MANUAL INFORMATION
~ PROPOSED SUBSTITUTION ~ OTHER _____

THE FOLLOWING ITEMS ARE HEREBY SUBMITTED FOR REVIEW AND ACTION:

	DESCRIPTION OF ITEM SUBMITTED (TYPE, SIZE, MODEL NUMBER, ETC.)	MFG. OR CONTR. CAT., DRAWING OR BROCHURE NO.	NO. OF COPIES	SPEC. SEC. NO.

I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as otherwise stated, and are stamped accordingly

_____
NAME OF CONTRACTOR

_____
SIGNATURE OF CONTRACTOR

PART 1 - GENERAL

1.01 BASIC REQUIREMENTS

A. WESTON will prepare weekly progress reports and a construction schedule and submit to EPA.

1.02 CONSULTANT SUBMITTALS

A. Monthly Progress Reports: Consultant will submit Monthly Progress Reports to the Project Manager with each application for payment. Such reports shall include the progress to date, modified activities since the previous submission, and revised projections of progress and completion.

1.03 SCHEDULE

A. Preparation of Schedules

1. Plot all activities on bar charts graduated in weeks.

2. Organize the bar charts so that activities in a given sub-network are plotted in numerical order on a given bar chart or charts.

3. Represent each sub-network by a single bar on a summary bar chart.

4. Show the following information on each bar chart:

a. Project title and number.
b. Date of preparation.
c. Abbreviated title for each activity.
d. Week ending dates and vertical lines marking same.
e. Symbol and abbreviation legend.
f. Activity interdependence on other activities.

5. Prepare schedules on 8.5-inch by 11-inch sheets.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 WESTON WEEKLY PROGRESS REPORTS

A. Preparation of Weekly Progress Reports

1. WESTON will prepare weekly progress reports for submittal to U.S. EPA.

2. The weekly progress reports will contain the following information:

a. List of activities completed during reporting period.
b. List of activities started during week.
c. List of upcoming critical activities.
d. List of activities not finished by scheduled completion date.
e. Unit quantities of work completed (where paid by unit quantity).
f. Title and number of project.
g. Date of report, i.e., last working day of week covered by report.

3. The following information will be included in the letter of transmittal:

a. Problem areas
b. Anticipated delays
c. Recommended actions

B. Submittal of Weekly Progress Reports

1. The weekly progress report will be submitted to EPA within 5 working days after the end of the reporting period.

3.02 CONSULTANT MONTHLY PROGRESS REPORTS

A. Preparation of Monthly Progress Reports

1. Consultant will prepare monthly progress reports for submittal to WESTON.

2. The monthly progress reports will contain the following information:

   a. List of activities completed during reporting period.
   b. List of upcoming critical activities.
   c. Personnel working on the project last month and responsibilities.
   d. Unit quantities of work completed (where paid by unit quantity).
   e. Date of report, i.e., last working day of month covered by report.
   f. Problem areas.
   g. Anticipated delays.
   h. Recommended actions.

B. Submittal of Monthly Progress Reports

1. The monthly progress report will be submitted to WESTON with the monthly invoice.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Minimum Health and Safety Requirements: Health and safety of Consultants personnel are the sole responsibility of the Consultant. Consultant shall take precautions to prevent damage, injury or loss to all employees on the work site and other persons who may be affected thereby.

B. Principal Work Items.

1. Prepare a Consultant-specific Health and Safety Plan (HSP) which includes but is not limited to the provisions in the HASP prepared by WESTON.

1.02 REFERENCES

A. All applicable OSHA requirements.

B. Requirements for Worker Health and Safety included in the National Oil and Hazardous Substances Contingency Plan (40 CFR 300.38).

C. All applicable State of Washington Regulatory requirements.

D. All applicable City of Vancouver Regulatory requirements.

E. All applicable Clark County Regulatory requirements.

F. CERCLA Sections (Superfund).

G. SARA Sections (Superfund).

H. Contingency Plan

I. Site Management Plan

J. WESTON Health and Safety Plan

1.03 SUBMITTALS

A. Consultant shall submit proposed Health and Safety Plan within 7 calendar days of Notice to Proceed.

B. Submit employee safety training documentation (doctor certifications, 40-hour training, 8-hour refresher and recent medical examination) with the HSP.

C. Qualifications of Site Safety Officer.

1.04 DEFINITIONS

A. Site Health and Safety Coordinator (SHSC). Construction Manager's representative responsible for implementation of the WESTON HASP and for periodic observation of Consultant activities to confirm that the provisions in the HASP are being followed.

B. Site Safety Officer (SSO). Consultant's representative directly responsible for the daily implementation of the Consultants HSP.

C. Exclusion Zone: Any portion of the project area in which hazardous chemicals are present, or may be reasonably suspected to be present in any medium (e.g., air, concrete, paint, soil, groundwater, etc.).

D. Contamination Reduction Zone (Transition Area): Area between the Exclusion Zone and Clean Zone that provides a transition between contamination and clean areas. Decontamination Stations are located in this zone.

E. Clean Zone: Any portion of the site outside the Exclusion Zone and the Contamination Reduction Zone. Support equipment is located in this zone.

F. Health and Safety Plan (HSP): Site Health and Safety Plan prepared by the Consultant approved for the specified Work.

G. OSHA Permissible Exposure Limits (PEL). Time weighted average (TWA) concentrations to which most workers can be exposed for 40 hours per week on a permanent basis with no significant health effects. These concentrations are enforceable OSHA standards. (Source: NIOSH/OSHA; Pocket Guide to Chemical Hazards).

H. Immediately Dangerous to Life and Health (IDLH). Concentrations representing a condition that is likely to cause death or immediate or delayed permanent adverse health effects or prevent the escape from such an environment.

I. Threshold Limit Values - Time Weighted Averaged (TLV-TWA). Time weighted average concentrations to which most workers can be exposed for 40 hours per week on a permanent basis with no significant health effects. They are similar to PELs except that they are not enforceable standards and are updated annually. (Source: ACGIH Threshold Limit Values and Biological Exposure Indices).

1.05 SITE SAFETY REGULATIONS

A. Contact with contaminated or suspected contaminated surfaces, soil surface water, or groundwater should be avoided.

B. Alcoholic beverages and controlled substances shall not be allowed on site.

C. A Consultant HSP shall be developed for all phases of site operations and made available to all personnel.

D. All Consultant personnel shall be familiar with standard operating safety procedures and any additional instructions and information contained in the site HSP.

E. All Consultants personnel shall adhere to WESTON's HASP and Consultant's HSP.

F. All personnel going on site shall be adequately trained and thoroughly briefed on anticipated hazards, safety equipment to be employed, safety practices to be followed, emergency procedures and communications.

G. Entrance and exit locations shall be designated and posted, and emergency escape routes shall be delineated. Warning signals for site evacuation must be established and communicated to all personnel.

H. WESTON will clearly establish the exclusion zone using markers or fencing.

1.06 SITE SAFETY OFFICER

A. Site Safety Officer.

1. Qualifications.

a. One or more years relevant experience.

b. Current certification in First Aid and CPR procedures.

2. Responsibilities.

a. Direct Consultant's Health and Safety activities on-site.

b. Report safety-related incidents to SHSC and fill out Lost Time Incident forms as required.

c. Implement Consultant's Health and Safety Plan and WESTON's HASP.

d. Maintain Health and Safety equipment.

e. Perform air monitoring as required by the Consultants Health and Safety Plan.

3. Authority.

a. Suspend field activities if health and safety of personnel are endangered.

b. Suspend an individual from field activities for infractions of the Health and Safety Plan.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 GENERAL

A. Consultants Health and Safety Program (as documented in the HSP) shall contain:

1. Project-specific Health and Safety Plan.
2. Health and Safety Training Program.
3. Standard Operating Procedures.
4. Air Monitoring Program (as required).

B. Minimum requirements are presented in this section. Consultant shall develop program using these elements as a basis, adding additional requirements as deemed necessary.

3.02 HEALTH AND SAFETY PLAN

A. General

1. Minimum requirements for Consultant's Health and Safety Plan are presented in this section. Consultant shall develop a job specific Health and Safety Plan using these elements as a basis, adding additional requirements as deemed necessary by the Consultant. The WESTON HASP will be provided to the Consultant so that pertinent provisions may be incorporated into the Consultant's HSP. Consultant shall not commence work prior to Project Manager's review of the Health and Safety Plan.

2. The Health and Safety Plan shall establish guidelines for the safety of personnel during the conduct of work. Consultant shall provide a copy of the Health and Safety Plan to each employee. All employees shall be required to read the Health and Safety Plan, sign a compliance agreement and abide by all provisions of the Health and Safety Plan. The Health and Safety Plan may be modified by the SSO in response to site conditions.

3. Health and Safety Plan shall include:

a. Site Description
b. Project Description
c. Hazard Assessment
d. List of Key Personnel
e. Air Monitoring Program (as required)
f. Emergency Response Procedures
g. Employee Training and Medical Monitoring Programs
h. Standard Operating Procedures
i. Engineering Controls (ventilation, etc.)
j. Decontamination Procedures

B. Site Description. Physical description of site and site conditions. Site-specific data pertaining to hazards. Identifies hazards known at time. If additional hazards are discovered, they should be added to this section by change order.

C. Project Description. Project-specific description of work to be performed.

D. Hazard Assessment. Hazard assessment shall address strategies for protection of workers

against the following hazards:

1. For activities that involve no hazardous material contact, primary hazards are physical hazards associated with construction, use of heavy equipment and fire hazards.

2. For activities that involve the potential for hazardous material contact, the following hazards shall be protected against:
   a. Physical hazards associated with construction, use of heavy equipment and fire hazards.
   b. Heat stress (as appropriate).
   c. Inhalation of contaminants.
   d. Skin or eye contact with contaminants.
   e. Ingestion of contaminants.

E. List of Key Personnel. Health and Safety Plan shall identify key Consultant personnel responsible for site safety as outlined in article 1.07. A list of the names of these individuals shall be conspicuously posted at the site.

F. Air Monitoring Program (as appropriate).

1. Health and Safety Plan shall designate personnel responsible for implementing the air monitoring program.

2. The Site Safety Officer shall be responsible for enforcing established Air Action Levels.

3. The Air Monitoring Program shall be described in detail in the Health and Safety Plan and as a minimum shall include:

   a. Work Area Monitoring Program during construction activities.
   b. Personnel monitoring, as appropriate.

4. Action Levels - Dust

   a. Real time aerosol monitor reading exceeding the nuisance dust threshold of 2.5 mg/m^3.

G. Emergency Response Procedures.

1. Emergency Response Procedures shall be included in the Consultant Health and Safety Plan.

2. Response actions to control releases of contaminants shall be included in the Consultant Health and Safety Plan.

3.03 TRAINING REQUIREMENTS

A. Consultant shall provide training to all of its employees and of its contractors that will be assigned to the project which complies with the requirements of 29 CFR 1910.21. Training shall cover:

1. Names of personnel and alternates responsible for site health and safety.
2. Health and safety hazards present on site.
3. Personal protective equipment use, care and limitations.
4. Work practices that minimize risks from hazard.
5. Safe use of engineering controls and equipment on site.
6. Hazard Communication (right-to-know program).
7. Site control measures.
8. Site standard operating procedures.
9. Contingency plan.
10. Confined space entry procedures (as needed).

In addition, employees who are responsible for responding to emergency situations shall be trained in how to respond to any anticipated emergency conditions.

B. Emergency Response Training

1. Fire Extinguisher Training. At least one member of each crew shall be trained in the use of portable fire extinguishers in accordance with 29 CFR 1910.157g.

3.04 INSPECTIONS

A. It shall be the responsibility of the Consultant to determine and document that their Health and Safety Program is being followed in accordance with minimum requirements of this specification and any additional requirements of the Consultant Health and Safety Plan. This shall be accomplished through the use of inspections and audits conducted by the Site Safety Officer and staff on a daily basis.

3.05 RECORD KEEPING

A. Consultant shall maintain, as a minimum, the records specified in this section and any additional records required to develop, implement and maintain requirements of the Consultant Health and Safety Plan.

3.06 REPORTING

A. Consultant shall provide submittals in accordance with article 1.03 of this section.

END OF SECTION

PART 1 - GENERAL

1.01 WORK INCLUDED

A. WESTON will arrange for a portable toilet for the site. Consultant will be given access to this facility.

B. WESTON will provide a temporary storage container for equipment and supplies.

C. WESTON will provide a single office trailer to be shared by WESTON and the Consultant. A single office will be provided for the Consultant.

1.02 GENERAL REQUIREMENTS

A. Comply with applicable local, county, and state ordinances and building code.

B. Complete work in neat and orderly manner.

C. Maintain to give continuous service and to provide safe working conditions.

D. Pay all costs associated with temporary facilities and services specified herein.

1.03 ELECTRICAL SERVICE

A. WESTON will furnish temporary electric power systems required to perform work.

1.04 TELEPHONE SERVICE

A. Provide temporary telephone service (Consultant only) throughout wall installation

period as needed.

1.05 SANITARY FACILITIES

A. WESTON will provide and maintain required facilities and enclosures.

B. WESTON will provide temporary sanitary facilities as needed including:

1. Portable containers to dispense potable drinking water.
2. Washing facilities including eye wash fountains.

1.06 FIRST AID FACILITIES

A. Consultant will provide first aid station in Consultants' office for Consultants personnel.

B. Consultant will provide full compliment of first aid supplies in weatherproof container at first aid station.

1.07 FIRE PROTECTION

A. WESTON will provide sufficient number of portable fire extinguishers, rated 2A minimum, throughout the site.

B. WESTON will provide means of notifying personnel in case of emergency.

C. Smoking onsite is prohibited.

D. Flammable/Combustible Liquids

1. Store flammable/combustible liquids in conformance with requirements of federal and local codes and regulations.
2. Provide approved metal safety containers for storage of flammable/combustible liquids in excess of 1 gallon.
3. Prohibit storage of flammable/combustible liquids near exits, stairways or common passageways.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. The work covered by this part includes furnishing all labor, materials and equipment, to mobilize to the site.

1.02 DESCRIPTION

A. Mobilization/Demobilization includes:

1. Consultant mobilization of all construction equipment, materials, supplies, appurtenances, and the like, manned and ready for commencing and performing the Work.

2. WESTON will set up exclusion zones, silt fence, equipment decontamination areas, and equipment sheds (as required), as indicated on the drawings. WESTON will install "Do Not Enter, Exclusion Area - Authorized Personnel Only" signs on the exclusion zone boundary.

3. WESTON/EPA will obtain injection and disposal permission required by the State and City.

4. Delivery to the site equipment, materials, and supplies necessary for performance of the Work, personnel required to commence work; and all other preparatory work required to permit commencement of the actual work.

5. Subsequent removal from the site of all construction equipment, materials, supplies, appurtenances, temporary facilities and the like upon completion of the work.

6. Removal of all excess reagents.

7. Preparation of required submittals.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Prior to project closeout, the Consultant shall prepare and provide all documentation required in this section, unless otherwise noted.

1.02 CLOSEOUT SUBMITTALS

A. Submit copies of pertinent design changes/record drawings or other notes documenting site conditions and/or work performed as requested by the Construction Manager.

1.03 EVIDENCE OF PAYMENTS AND RELEASE OF LIENS

A. Consultant's Affidavit of Payment of Debts and Claims.

B. Consultant's Affidavit of Release of Liens:

1. Consent Of Surety to Final Payment.

2. Consultant's release or waiver of liens.

3. Separate releases of waivers of liens for subcontractors, suppliers, and others with lien rights against property of Project Manager Settling Agent, together with list of those parties.

C. Duly execute all above submittals before delivery to the Project Manager.

1.04 FINAL APPLICATION FOR PAYMENT

A. Submit final application in accordance with Section 01027.

1.05 FINAL CERTIFICATE FOR PAYMENT

A. Project Manager will issue final certificate in accordance with provisions of the Contract.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. WESTON will maintain at the site one record copy of:

1. Drawings
2. Specifications
3. Addenda
4. Change Orders and other Modifications to the Contract
5. Construction Manager Field Orders or written instructions
6. Field Test records
7. Construction photographs
8. Health and Safety Certifications

1.02 MAINTENANCE OF DOCUMENTS

A. WESTON will:

1. Store record documents in the field office apart from documents used for construction.

2. Maintain record documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

3. Make record documents available at all times for inspection.

1.03 RECORDING

A. WESTON/Consultant will:

1. Label each document "PROJECT RECORD."

2. Record information concurrently with ISRM Wall Installation progress.

3. Legibly record the following to document actual work:

    a. Actual locations and depths of treatment wells.

    b. Quantities of reagent injected.

    c. Quantities of reagents extracted after injection.

    d. Time reagent remained in ground before extraction.

    e. Other operating parameters as required by the Consultant.

    f. Details not on original contract drawings.

4. Legibly mark each specification Section to record:

    a. Changes made to original design.

    b. Other matters not originally specified.

B. Consultant will:

1. Record all pertinent operating parameters.

2. Record all analytical data during installation of the wall.

3. Prepare a draft and final report documenting the wall installation.

1.04 SUBMITTALS

A. Consultant will submit a draft ISRM Wall Installation Report to WESTON for review and comment.

B. Upon receipt of comments, Consultant will revise the draft report and submit a final report to WESTON for final review. Any comments will be incorporated and a final report will be prepared and submitted.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 WORK INCLUDED

A. WESTON responsibilities:

1. Ensure a chain link fence is present around the area where office space and equipment storage is located as shown on the drawings.

2. Provide a CONEX storage box for storage of small equipment and supplies.

3. Control visitors on-site.

B. Consultant responsibilities:

1. The Consultant is responsible for ensuring all Consultants equipment is locked up and secure when on and off site.

1.02 SECURITY EMERGENCIES

A. The WESTON Construction Manager shall coordinate with local law enforcement officials (i.e., police/sheriff, highway patrol, emergency medical corps units, fire department, and utility emergency teams) to map out contingency plans for any emergency situation as specified in the Contingency Plan given.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. This specification describes the requirements for installation of the ISRM Treatment Wall

1.02 SEQUENCE AND SCHEDULE

A. The wall will be installed in 2 phases to allow information from the first phase to be used in optimizing treatment well spacing in the second pahse.

B. The first phase of the wall will be installed beginning on the west side of the pilot scale area working east and consist of intalling wells for 3 injection locations. The second phase will complete the remainder of the wall installation (3 additional locations).

C. Work shall be performed during daylight hours to the extent possible.

D. Plan operations to minimize temporary disruptions to existing facilities or adjacent property.

1.03 SAFETY

A. Perform all work in accordance with:

1. Consultants Health and Safety Plan
2. All applicable OSHA regulations
3. WESTON's Health and Safety Plan
4. Site Management Plan

1.04 EXISTING UTILITIES

A. WESTON will locate and mark existing utilities in the area where well installation is to occur. Treatment and monitoring wells will be installed a minimum of 5 feet from these utilities.

1.05 ENVIRONMENTAL CONTROLS

A. Use appropriate controls to limit noise to acceptable levels. Noise shall be limited to 70 dBA at the facility boundary.

B. Cuttings from well installation (performed by WESTON) will be loaded into drums and stored on-site. These cuttings will be treated during source area treatment performed by others. The location of the drum staging area is shown on the drawings.

C. Do not disturb or damage areas on or adjacent to the project site.

D. Prevent stormwater transported sediment from disturbed areas from leaving the site.

E. WESTON/Consultant shall minimize transport of soil outside the contaminated soil area boundary shown on the drawings. To this end, all heavy equipment used in wall installation shall be kept outside the contaminated soil area, to the extent practical.

PART 2 - PRODUCTS

2.01 EQUIPMENT AND MATERIALS

A. Reagent used in wall installation will be received in transport trucks and consist of approximately 0.8M sodium diothionite and 3.1M potassium carbonate pH buffer solution.

B. Delivery of reagent will be performed by a licensed hauler.

PART 3 - EXECUTION

3.01 HYDROSTRATIGRAPHY CHARACTERIZATION

A. A hydrostratigraphy characterization will be performed along the length of the wall alignment prior to installation of 6-inch treatment wells. The characterization will consist of installing screened 2-inch wells to a depth of 35 feet using a geoprobe rig. The wells will be screened from immediately below the clay layer to the bottom of the well using PVC slotted screens. The geoprobe casing will be partially pulled to expose the full screen length; downhole borehole flowmeter tests along the length of the screen will subsequently be completed.

B. After the borehole flowmeter tests have been completed, the well screen will be pulled (if possible) and the hole abandoned. If the well casing and screen can not be removed, it will be overdrilled and pulled during treatment well installation.

C. All geoprobe wells will be logged during installation.

3.02 TREATMENT WELL INSTALLATION

A. A series of twelve 6-inch diameter treatment wells will be installed. Two treatment wells will be installed at each treatment location. The wells will be installed to depths of approximately 25 feet and 35 feet. The exact depths will be determined from the pre-installation hydrostratigraphy characterization. The shallower wells will be screened from approximately 22 to 27 feet; the deeper wells will be screened from approximately 27 to 35 feet. All treatment wells will be installed using 20-slot wire wrapped screen.

B. The wells will be developed until they produce approximately 20 gpm. If development does not produce the required yield, other techniques such as jetting, surging, or water injection into the well will be performed to increase the yield.

C. Treatment wells and reagent injection will be completed in phases. The first phase will consist of installing 6 treatment wells (for 3 injection locations). The second phase will be completed after reagent is injected into the 6 treatment wells and radius of influence information is obtained. Based on this information, spacing of the final 6 treatment wells will be determined and the second phase of treatment well installation will be completed.

3.03 REAGENT INJECTION AND EXTRACTION

A. The Consultant shall inject approximately 5,700 gallons of reagent mixed with 38,300 gallons of water into each of the six treatment zones. The Consultant shall provide the reagent, mixing equipment, flow monitoring equipment and any other equipment needed for the injection.

B. The reagent shall remain in contact with the soil for a period of approximately 24 hours hours and then shall be extracted. A minimum of one pore volume (approximately 44,000 gallons) of extraction fluid will removed. The extracted water will be discharged into the City of Vancouver sanitary sewer system.

C. Equipment and hoses shall be run in such a manner as not to impact operations at Cassidy Manufacturing as shown on the drawings.

D. WESTON will provide water supply hoses, road crossings, traffic control, traffic permits,

signage, and a water source.

3.04 OPERATIONAL/PROCESS MONITORING WELLS

A. Operational/process monitoring wells (9) will be installed in the locations shown on the drawings. The purpose of these wells is to evaluate the radius of treatment as well as the performance of the treatment wall. Eight shallow and intermediate depth wells will be installed. The shallow and intermediate wells will be 2-inch in diameter and be installed at a depth of approximately 27 and 35 feet respectively (depending upon the stratigraphy). The wells will be screened from approximately 22 to 27 feet and from 27 to 35 feet with 20-slot screen. A single deep well installed at a depth of 45 feet will also be installed and screened over the last 5 feet of length.

3.05 GROUNDWATER MONITORING WELLS

A. Groundwater monitoring wells (2) will be installed downgradient of the wall as shown on the drawings. The purpose of these wells is to monitor groundwater quality downgradient of the treatment wall. These wells will be 2 inch in diameter, approximately 35 feet deep, and be screened from the bottom of the silt/clay layer to the bottom of the well.

3.06 WELL INSTALLATION PROCEDURES

A. Wells will be installed with a sonic drill rig. Visual logging of the soil will be performed. Wells will be installed by WESTON.

B Well logs will be prepared by WESTON.

C. Equipment decontamination water and well development water will be stored in an on-site tank provided by WESTON. WESTON will treat this water using sodium metabisulfite and discharge it to the City sewer system. Treatment goals will be 50 ug/L hexavalent chrome as determined in the field using test kits.

D. Cuttings from well installation (performed by WESTON) will be loaded into drums and stored on-site. The location of the drum staging area is shown on the drawings.

E. Wells will be installed per WAC 173-160 “Minimum Standards for Construction and Maintenance of Wells”.

3.07 UTILITY SERVICES

A. Electrical power will be provided by WESTON.

B. Sanitary facilities consisting of a portable toilet will be provided by WESTON.

C. Bottled drinking water will be provided by WESTON.

3.08 SAMPLING AND ANALYSIS

A. The Consultant will be responsible for collecting any samples needed during installation of the wall. The consultant shall convey the analytical requirements needed from an outside laboratory to WESTON. Arrangements for analytical services will be provided by WESTON. It is anticipated that total dissolved solids, sulfur and trace metals analyses will be required during the wall installation phase.

B. After the diothionite injections have been completed, six rounds of operational monitoring will be completed. One round will be completed 2 weeks after the last injection and the second round will be completed 6 weeks after the last injection. Four subsequent rounds will be completed quarterly thereafter.

C. Samples will be collected from the operational/process (9) and groundwater monitoring (2) wells shown on the drawings. Samples will also be collected from up to 6 of the injection wells and the upgradient well (MW-9) installed during the pilot scale test.

D. Samples will be analyzed for trace metals (Na, Mg, K, Ca, Al, Cr, Mn, Fe, Ni, Cu, Zn, As, Se, Mo, Ag, Cd, Sn, Sb, Ba, Pb), chlorinated solvents, hexavalent chromium, and anions (Cl^-, Br^-, SO_4^{2-}, SO_3^{2-}, PO_4^{3-}, NO_2^-, NO_3^-).

E. Field parameters (electrical conductivity, dissolved oxygen (DO), oxidation-reduction potential (ORP), temperature) will be measured from the operational/process and groundwater monitoring wells during sample collection.

END OF SECTION